

ZERO RETRIES

The Quarterly Journal of the
Northwest Amateur Packet Radio Association

Spring, 1990

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Steve Stroh N8GNJ Editor

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This issue of Zero Retries is being mailed to all recent members of NAPRA. Please take a moment to check your mailing label and renew if your membership has expired. NAPRA's only means of support is membership dues. NAPRA needs your support to maintain and enhance SEA, SEAW, and the Pacific Northwest Packet Radio Network.

**Ray Petit W7GHM to
be the featured
speaker at the July
14th NAPRA
General Meeting**

**Please note that
the meeting is
NOT in Tacoma!**

Ray will be speaking on the CLOVER system, which he and several others have developed to provide vastly increased data throughput on the HF bands. When band conditions are ideal, CLOVER delivers error free data slightly faster than packet, and substantially faster than AMTOR. When band conditions are poor, CLOVER slows down and delivers data from 10 to over 1000 times faster than packet. 20 CLOVER signals can be packed (without mutual interference) into the 2KHz bandwidth required by 1 HF packet or AMTOR QSO.

The July 14, 1990 NAPRA General Meeting will be held at the Stanwood Public Library, 9701 271st Avenue, Stanwood, WA, 206/629-3132, in their Conference Room beginning at 1:00 PM. From I-5 North, exit at Exit 212. Turn left at the bottom of the ramp (West) onto Route 532 for approximately 6 miles. After you enter Stanwood, turn right at the first intersection past the bridge, go one block, and turn left on onto 271st. The Library will be on your right.

**NAPRA President
Don Werts N7NKJ
Resigns**

In a letter to the NAPRA Board of Directors dated June 6, 1990, NAPRA President Don Werts N7NKJ stated that effective immediately he had resigned from the NAPRA Board of Directors. Don did not state any reasons for his resignation.

At the June 20 NAPRA Board of Directors meeting, the Board asked Ken Koster N7IPB to join the Board to fill the Board position vacated by Don, and Ken accepted. It was decided not to exchange Board member's duties, since the annual elections will be held in the near future.

Don has since stated that he intends to stay active in NAPRA.

**Net Controls
Needed!**

The 9:00 PM Thursday Night Packet Radio Ragchew on the Evergreen Intertie repeater Network is an informal net and has proven to be a valuable resource to both novice and experienced packeteers. Although the net is informal, it is directed by a Net Control Station to allow as many stations as possible to get their questions and comments in. **We need more Net Control operators!** If you can help, please contact NAPRA Executive V.P. John MacDuff KA7TTY @ N7HFZ or 392-7693.

Dropped Bits

Editorial by Steve Stroh N8GNJ

As many of you know from the last issue, there have been some major enhancements to Zero Retries. The biggest single change was to produce Zero Retries on an Apple Macintosh in conjunction with a laser printer. While I am still primarily a PC user, I have to admit that the Mac offers a lot more options for producing documents such as this one. In particular, I love the flexibility of columns and variable type styles. The Mac is far from perfect, though. There are times when you can get it to *almost* do what you want, but not quite.

Zero Retries is now officially a quarterly publication, per a recent decision by the NAPRA Board of Directors. There will be four issues per year, labelled according to the seasons.

Spring: April - June,
Summer: July - September,
Fall: October - December, and
Winter: January - March.

The mailing date will be the first week of the middle month, with the goal of receiving Zero Retries a week or so before the meeting during the middle month. The Deadline for each issue will be the Saturday *after* the first month's meeting. So, the dates for the rest of 1990 are:

Summer:

Mailing: by August 4, 1990.
Deadline: July 21, 1990.

Fall

Mailing: by November, 3 1990.
Deadline: October 20, 1990.

An improvement that I hope to make to Zero Retries is to introduce topical issues. One issue each year will be targeted at beginners on packet, with explanations on such topics as how to use the network, BBS', and general packet technique. I'm open to suggestions for other topical issues- subjects such as TCP/IP, high speed packet, and packet software are also being considered.

Another improvement is the idea of regular columns. One of the biggest advantages of a quarterly publication as opposed to one that is published more frequently is that a quarterly schedule is much more reasonable to those that maintain a busy lifestyle. I hope to enlist some columnists and feature their columns in the Summer issue.

It is my intention to include a printed copy of the NAPRA roster in Zero Retries at least once per year.

I also plan to publish KN7MVO's map of the Pacific Northwest Packet Radio Network as often as possible. Marc did not release updated copies of his map for several months because of the

many changes that have taken place in the Network. Now that the Network has stabilized somewhat, Marc has resumed publication of his map.

And finally, a plea for feedback. Basically, we need some! The NAPRA board of directors would really like to hear what's on your mind. The names and numbers of all of the Board members are included elsewhere in this issue. Please- let us know what you think!

I want to take this opportunity to thank Peter Dahl WA7FUS for his assistance and encouragement in producing Zero Retries (especially the last issue!) Peter got me back on track with this issue by reminding me that Zero Retries didn't necessarily have to include *EVERYTHING* that's happening in packet. This tendency is a bad trap for those, like myself, who have access to many sources of information about packet radio too often fall into. As I have mentioned previously, Peter has volunteered to be the publisher of Zero Retries. He takes the "camera ready" masters and handles getting them printed and mailed. We work well together, and I'm very grateful for Peter's help and steady stream of ideas.

ARRL 9th Annual Computer Networking Conference To Be Held In London, Ontario

The American Radio Relay League and the Canadian Radio Relay League are joint sponsors of this year's Computer Networking Conference which will be held on **Saturday September 22,**

1990 at the London Regional Art Gallery and Museum, 421 Ridout Street North, London, Ontario. The fee for the conference is \$20 US or \$25 Canadian. To register, contact Harry MacLean VE3GRO, 500

Riverside Drive, London, ON N6H 2R7. You'll receive a confirmation in the mail, along with maps and additional information related to the conference.

Digicom for PC's?

Coming soon: TNC emulation software for the IBM PC and compatible computers. Flori Radlherr, DL8MBT, the author of DIGICOM, the very popular TNC emulator for the Commodore C-64, is presently testing BAYCOM for

the PC. BAYCOM will include all of the features of DIGICOM (remote commands, screen editor, etc.) and more.

Besides the software and a PC, all that is required is a serial port on the PC and a simple one-chip (TCM

3105) modem that can be built for approximately \$30. Note that BAYCOM is still being tested as this is written. An official announcement concerning its actual release will be forthcoming. From QEX/Gateway, June 1990.

The President's Column Don Werts N7NKJ

Another issue of Zero Retries means another head scratching session for these fingers. Let's see, the SEA Node is back up and running, thanks to Doug Lux, WB6VAC, and his snow cat. While up at the site, we also located some major causes of the intermod that was causing problems and they were eliminated, temporarily. Later in the Summer, we'll need a few helpers to go with us to make those permanent. Hopefully, by the time you read this, SEAW will be back to normal (the SEAW node was able to attract another bullet into it's coax, third one in about a year!). Currently, it is running at reduced power and on a 72 Mhz vertical directional antenna.

Good news regarding the 440 Mhz backbone. The WWARA has assigned it a repeater pair of frequencies and crystals should be here any day now. A fair amount of work is yet to be done on the radio's, which are Motorola Micors. Initially, the new backbone will be operating at 1200 BPS, full duplex with near term plans to up it to 9600 BPS. For those of you who haven't attended a recent NAPRA meeting, the plan is to have this Node

communicate with the #SEAW, #EVT, #OLY, #Mt Erie, #SEA, #PTN and #SITN2 nodes.

This arrangement permits us the same connectivity we currently enjoy. #ABER will be available off of the #OLY node, similar to it's operating off of #CPK way back when.

The Olympia Amateur Radio Society (OARS) is sponsoring the new OLY node.. It can be found on 145.07 MHz. Many thanks to Don and Carol Hill of the OARS for their support and enthusiasm in getting this project off the ground (no pun intended) We also understand that Don will be the BBS Sysop for the OLY node.

The #EVT and EVT node will be moved to Mt. Pilchuck in the next few weeks, according to Ralph, KATVEE. Seems like the snow is still too high on some portions of the mountain road.

Those of you who are interested in doing some work on the new 440 mhz backbone equipment, let us know what you are comfortable in contributing. We're in need of someone who can wirewrap some small boards, do some minor sheetmetal work such

as drilling holes for connectors and LED's and some cable wiring inside the radios. Seemingly a lot of small tasks, but they all take time, especially when there are 4 to 6 of these to be built and tested. Please let us know, this is your network!!

In the last issue of the Zero Retries, we included a questionnaire, hoping that you would fill it and include any comments you felt were needed. Either the questionnaire was ripped off from all the copies, or, you feel that the NAPRA Board of Directors are doing an outstanding job and there's no room for improvement! I don't believe either of those scenarios! So, at the back of this copy of your Zero Retries is another copy of the questionnaire. PLEASE fill it out and return it. Without feedback, the Board of Directors may be going down a path that the membership doesn't agree with. We need your input to assist us in fulfilling our responsibilities to you. Thank you.

[This column was written in mid May. -Ed.]

NAPRA Meets TOPS Don Werts N7NKJ

No, this isn't show biz, TOPS is actually The Oregon Packet Society.

On Saturday April 21st, at a meeting in Chehalis, WA., we all sat down to discuss the possibility of re-connecting the Puget Sound with Oregon via a packet network. Several possible scenarios were explored such as, Capitol Peak to Longview (CPK to LSO), Olympia to Longview, SEA to Aberdeen and even Microwave was discussed. The attitude of those participating were concerned with one thing, a path to and from Puget Sound to Oregon!

One concern, which was voiced, is the difference in network routing philosophy used in the two regions and how do we connect

them together without impacting each of the networks. No decision was made on how to solve this problem at the meeting. It has to be addressed before we connect the two networks together.

Actually, we've known for quite some time that the SEA node hears the Astoria (AST) node and vice-versa. How well they hear each other is not well known! We know that SEAW and the Aberdeen (ABER) node also have a workable path and that Aberdeen and Astoria also hear each other. So, we may have a temporary solution to connecting these two areas. I say temporary because the paths may not be much more than 80% reliable. In the near future, we'll have the opportunity to install a

good node from Capitol Peak to Oregon, and use these other paths as overload or back-up paths. I've been told that the new Olympia (OLY) Node hears the LSO node broadcast, on the backbone. Tests will be conducted, by the OLY group, to see how reliable this path appears to be.

As information becomes available, we'll post it on the BBS' for you.

The next meeting of TOPS and NAPRA is tentatively set to take place at the SEA-PAC convention.

[TOPS and NAPRA did indeed meet at the SEA-PAC convention and several areas of cooperation were worked out. We were very impressed with the TOPS organization. -Ed.]

NAPRA Notes Steve Stroh N8GNJ

Puget Sound Packet Information Sheet

The Yellow sheet enclosed in this issue of Zero Retries is now in wide distribution in the Seattle area. Copies have been distributed to Amateur Radio Supply and C-Comm, as well as at the Sea-Pac Convention and NAPRA meetings. NAPRA intends to update and reprint this flyer as necessary. If you would like additional copies, please contact Steve Stroh or Peter Dahl.

SEA Status

From all reports, SEA is functioning fine. One project in the works for this summer is to replace the radio package with the package that was intended for the ill-fated full duplex conversion (the full duplex package has been reconfigured for simplex operation). The current radios have quite a few hours on them, and the full duplex package was engineered with a heavier duty cycle in mind.

SEAW Status

In a word, wounded. As Don mentioned in his column, the Winter and the gun nuts have been pretty cruel to the SEAW site. SEAW is still running on a mismatched antenna, which causes very odd patterns and paths. There have been many reports that SEAW can be heard full quieting, but cannot be worked with 25 watts and a beam pointed at it. At other times, SEAW functions perfectly normally.

A repair party is planned for early July to replace the antenna, and possibly relocate it. The

equipment will also be checked while we are at the site. Look for GREATLY improved performance from SEAW very soon.

Later in the summer, an experiment is planned for SEAW. As reported elsewhere in this issue, the TCP/IP programs have finally achieved full Net/Rom capability, and that means that an "IP Switch" can replace a Net/Rom cluster with no loss in functionality- a considerable gain in functionality, in fact. A single PC with appropriate modems can replace the entire Net/Rom clusters. (Obviously an IBM PC type computer wouldn't survive long in the mountain and high RF environment, but there are several PC compatible packet switches about to come on the market, as well as some more rugged types of PC's.) The plan is to try out the IP switches at SEAW. SEAW was chosen because it's easy to get to (relative to some of the other more remote sites) and it has multiple ports on it- SEAW, #SEAW, and YTHNET. One of the nicest features of having an IP switch is that TCP/IP users will be able to be able to intercommunicate much better, instead of the relatively inefficient technique of emulating Net/Rom nodes that is currently used.

440 Backbone Repeater Status

The 440 Backbone Repeater is progressing nicely. As reported by Don, a frequency has been coordinated with the WWARA. Negotiations for the use of the site

are currently underway, and the initial reports are encouraging. We don't want to say too much about the site quite yet, but it is a good one, and well worth the effort we're going to go get access.

The RF gear for the 440 Backbone Repeater is very near completion. The repeater is based on a pair of Motorola Micor radios, one acting as a receiver and one as a transmitter. One advantage of this is that each unit is a "hot spare"- if the main receiver goes out, for instance, the radios can be reconfigured so that the original transmitter radio now acts as the receiver radio, and the original receiver radio, with a good transmitter now becomes the transmitter radio. The documentation is nearly complete, and the only real work left to do is some relatively trivial wire wrap boards for some audio conditioning.

The antenna system for the Repeater has been complete for some time. The antenna is a beautifully constructed 440 MHz Slotted Array, which gives omnidirectional coverage with horizontal polarization. The horizontal polarization should reduce the noise content of the channel significantly.

When the repeater package is complete, the documentation will be given a final check and then distributed so that others can construct modify the Micor radios to build a node.

Do You Currently Have An IBM AT Type Computer (But Secretly Lust After A 386)?

The Evergreen 386 SuperChip might be the answer for you. The SuperChip is a small board that combines a 386SX microprocessor and support circuitry which make the SuperChip a pin compatible replacement for an 80286 microprocessor. All you do is simply remove the Pin Grid Array or PLCC (socketed) 80286 and plug in the SuperChip. The SuperChip is NOT an accelerator board- it has no

onboard memory or clock. Your system runs at the same speed as before, but now your system can handle memory much more efficiently due to the built in memory management capabilities of the 80386SX microprocessor.

The Virtual 86 capability of the 80386SX can let you run multiple programs simultaneously (with hardware boundary protection- if a program goes wild, the processor's

hardware won't let it interfere with the memory space of other programs). If you're currently running Desqview, you'll find that Desqview works much better with an 80386SX than with a 80286 microprocessor.

Evergreen Technologies, Inc.,
1325 NW 9th Street, Corvallis, OR
97330, 503/757-7341 or 800/733-
0934. Price: \$295.

PACKET RADIO INFORMATION

FOR WESTERN WASHINGTON - SUMMER 1990

The Northwest Amateur Packet Radio Association

NAPRA is an organization of Amateur Radio Operators dedicated to the growth and continued improvement of the Pacific Northwest Packet Radio Network. NAPRA was one of the first organizations in the country to base their portion of the Amateur Packet Radio Network (AMPRNET) around the concept of a "backbone"- a dedicated channel for linking between nodes. This concept has proven to work extremely well- so well, in fact that the backbone channel is now seriously overloaded from the more than fifty nodes connected to it. NAPRA sponsors the two primary nodes in the Seattle area- SEA on 145.01 and SEAW on 144.99. NAPRA is in the advanced stages of constructing a 440 MHz full duplex repeater system that will help take some of the load off of the backbone channel. When it is completed and installed early this summer many of the nodes in the Seattle area will move their backbone connection to take advantage of this new system. NAPRA is involved in experiments with faster modems for packet radios, such as the TAPR PacketRadio which will run at 9600 baud instead of the current standard 1200 Baud. NAPRA is also investigating the use of more robust packet protocols such as TCP/IP. NAPRA plans to install several "IP switches" on key node sites this year for experimentation. Those using the current Net/Rom node controllers will notice little difference, other than additional features becoming available.

NAPRA General meetings are held on the second Saturday of each month, beginning at 1:00 PM. The meetings rotate between the Radio Club of Tacoma's Clubhouse, 1249 Washington Street in Tacoma on odd months, and the Boeing Employees Amateur Radio Society (BEARS) Clubhouse at the Renton Municipal Airport on Airport Way in Renton on even months. The General meetings are structured to allow plenty of time for the featured program, and a question and answer session, as well as advanced and beginner's chat sessions. NAPRA Board of Director's meetings are held on the third Wednesday of each month at the Omni Restaurant, 4701 South 188th Street South in Seattle, beginning at 7:00 PM.

Membership in NAPRA is open to all interested individuals. NAPRA's yearly dues are \$15.00 and include a subscription to NAPRA's quarterly newsletter Zero Retries. For more information on NAPRA, please write to: NAPRA, 2948 217th Place SW, Brier, WA 98036, WA7FUS @ KD7NM, TCP/IP 44.24.0.21, E-mail- pdahl@milton.u.washington.edu.

Recommended TNC Settings

Setting your TNC to these parameters will help make the most effective use of most nodes:

Dwait: 16 Frack: 6 Paclen: 80 Resptime: 5

Packet Radio Voice Net

The Thursday Night Packet Radio Ragchew is an excellent place to get help with any problems you might be having with Packet Radio. The Ragchew meets every Thursday evening between 9:00 and 10:00 PM on the Boeing Employees Amateur Radio Society's 145.33 repeater. The Ragchew is also carried on other repeater systems linked into the Evergreen Intertie repeater linking system. Helping newcomers to packet is a special interest of the Ragchew.

Another great place to get help with packet problems is the 224.78 "Packet Intercom" repeater. Many Seattle area packeteers use this repeater.

An Introduction to Packet Radio booklet is available

A printed copy of An Introduction to Packet Radio by Larry Kenney WB9LOZ is available for \$5.00 (to help defray the cost of printing and postage) from NAPRA. This excellent 16 part series is written in tutorial form, and starts with an introduction to what Packet Radio is, and continues through topics of interest to advanced packet users. Additional articles, including such classics as "Packet POOP" are also included with the series.

Operating with TCP/IP

To get a TCP/IP address, contact Clifford Neuman N1DMM¹ or Dennis Goodwin KB7DZ². Most TCP/IP activity takes place on the YTHNET 224.56 repeater system and the SEAW 144.99 Node. The YTHNET repeater is dedicated to packet activity, and it's full duplex nature makes it an excellent place to use TCP/IP. Many users are using the new PA0GRI Largenet software, G1EMM's version of NOS, and KA9Q's latest NOS releases. All of these packages add many features not found in the stock KA9Q TCP/IP "net" software.

Direct, But Deadly! (Why Not To Connect Direct On A Simplex Node Frequency)

Briefly, the main point about connecting direct to your buddy or a BBS when using a simplex node frequency is that the node cannot act as "traffic cop" for the node frequency and allow equal access to all if you don't connect to the node and then request the node to complete the connection for you. If you do go direct on a node frequency, the node will hear your signals, and refrain from transmitting. Packets sent to the node by other stations do not get acked, forcing retries, and traffic coming in from the backbone can't go anywhere. Eventually the node's buffer fills up and resets itself, disconnecting all users. This effect is very similar to working simplex on the input of a PL protected repeater. The stations working simplex aren't bothered, but their use of that frequency blocks use of the repeater by other users.

It's Simple Fairness- When On A Simplex Node, Please Don't Connect Direct.

If you want to work direct with another station, the frequencies 145.71, 145.75, and 147.79 are designated for experimental purposes (145.73 and 144.77 are also experimental frequencies, but are currently used by the Seattle area DX Packet Cluster.)

Node Information

144.91 Ellensburg	ELN:N7HHU-8	145.01 Enumclaw	SEA:WN7ANK-8	145.07* Vancouver BC	YVR:VE7LAN-4
144.93 Astoria OR	AST:W7FBM-8	145.03 Port Townsend	PTN:K7TPN-8	145.09 Everett	EVT:KA7VEE-8
144.95 Seattle	ALKI:N7FSP-1	145.05 Spanaway	SITN2:WA7NTF-8	146.98* Enumclaw	BALDY:WB6VAC-8
144.97 Victoria BC	SPR:VE7SPR-7	145.05 Vancouver BC	SVAN:VE7LAN-4	224.56* Bremerton	YTHNET:WB7FHC-8
144.99 Bremerton	SEAW:N7HFZ-8	145.07 Olympia	OLY:K7APT-8	* Full duplex node	

¹ P.O. Box 45775, Seattle, WA 98145-0775, 206/789-8788 (home), 206/543-7798 (work), E-mail- bcn@cs.washington.edu.

² 1748 Harrison Avenue SE, #M4, Port Orchard, WA 98366, 206/871-5818 (home), 206/396-2160 (work), KB7DZ @ KD7NM, TCP/IP 44.24.0.6.

Northwest Amateur Packet Radio Association

Membership Application and Renewal Form

NAPRA, the Northwest Amateur Packet Radio Association is an organization of Amateur Radio Operators dedicated to the growth of the Amateur Packet Radio Network (AMPRNET) in the Pacific Northwest. Membership is open to all interested individuals. NAPRA's yearly dues are \$15.00 and include a subscription to NAPRA's quarterly newsletter Zero Retries.

Name: Call:

Address:

City: State: Zip:

Phone: BBS: TCP/IP:

Any information you **don't** want
published in the NAPRA Roster?

**The information below is optional. This information helps NAPRA in its efforts
to improve the Pacific Northwest Amateur Packet Radio Network.**

Packet Capable
RF Equipment:

Computer & TNC
Equipment:

Member of other
Organizations?

Special Skills
(RF H/W, S/W):

Any
Comments?

**Please return the completed application to:
NAPRA, 2948 217th Place SW, Brier, WA 98036**

Doug Lux WB6VAC Offers Land Line Network For Wide Area Networking

I have gotten the preliminary OK to lay out a possible wireline Net/Rom WAN (wide area network). It would have outlets in Spokane, Portland, and Seattle to start with. The idea is to use a commercial data network, during the off hours when they are closed. It would be a separate network without nodes broadcasts so that when it goes down on weekdays, it does not remain in the nodes tables for six hours. The idea would be to have forwarding go down this trunk when possible, to allow the radio side a little relief. Spokane could forward direct to Portland and so on. The possible hours of operation look to be about 7PM to 6AM Monday to Friday, longer hours on Saturday,

but not yet defined, and probably all day on Sunday.

Depending on some things that might happen in the future, I might be able to keep it up at all times but at a reduced data rate in the day time. Now this is where it stands. I personally have no use for this- I'm not into BBSing nor do I correspond with any one in these areas, but I know that a lot of you do. In the past everything has been done and supported by just a few of us while the rest of you go along for the free ride and then gripe if it's not perfect. If this thing is to come about, there will have to be enough users out there in the affected areas who want it and are willing to chip in and make it happen. If not then the only

wasted time is in thinking the thing up. Each area would have to support the purchase or donation of a radio and TNC for their area. The radio can be on what ever frequency is the best for that area's access. In the future, if this thing goes, we might even be able to have direct access on multi frequencies (with an additional radio and TNC). The trunks can do 9600 at night. If there is enough support to put this together, then I will make the necessary control logic to make it all happen. So it's up to you, the users, put up or forever hold your gripes. Send your comments to me via the N7HFZ BBS.

New Motorola Data Radios Announced

Motorola's Radius Division recently announced new line of radios designed primarily for Data Communications. The RNet series Telemetry Radios have many attractive features. They are smaller than a typical TNC. They can accommodate two channels, and are capable of two power levels, both of which are remotely controllable. The RNet's are simple- there is a DB-15 connector, and a

BNC connector. That's it- no LED's, no controls, simply power and data in, RF out. The only problem with these radios is that they are designed for commercial use, and commercial frequencies. The RNet 150 covers all of 2 meters. One of the RNet 450 models covers the 420-430 segment of the Amateur UHF band (which is off limits to those of us North of Line A, of course), but there is no coverage

for 430-450 MHz in the RNet line. The quantity one price for the RNet radios is \$325.

For more information, contact Motorola, Inc., Radius Division, 1301 E. Algonquin Road, Schaumburg, IL 60196-1078, 708/576-6760. The local representative for the RNet line is Don Parker at 462-2647.

Seattle Area TCP/IP Activity

TCP/IP is really booming lately! There are over a dozen users that are on full time, and many more who are on the air occasionally in the greater Seattle area. Currently most tipsy users are using the SEAW, YTHNET, or BALDY nodes and are in the nodes tables as #IPXYZ. Although it is slow and cumbersome, the Net/Rom emulation built into the tipsy software does allow us to intercommunicate for mail and file transfers reasonably well.

The greatly enhanced capabilities of the latest versions of G1EMM NOS and largenet have got us tipsy users very excited and we have several projects planned for implementation this summer to take

advantage of our new capabilities.

We have enough computer parts to put together several bare bones PC clones to act as IP switches and dedicated servers. We are really looking forward to having POP (Post Office Protocol- will accept mail for a station not on the air at the moment) and RIP (Routing Information Protocol- will eliminate the need to maintain static routes tables at each station) servers active.

There are at least two local area IP switches planned. One is by Ken Koster N7IPB on 440 MHz, and will be full duplex, and possibly high speed. Another may be on 2 meters.

There is a large group of tipsy users at the North end of Lake Washington that are within simplex range of each other and plan to set up a simplex network among themselves. It will be interesting to see the TCP/IP protocol in action when it doesn't have to constantly give ground to AX25 users with impolite parameters. Several stations planning to participate in this network plan to dual port to other nodes, such as YTHNET and BALDY, and the planned 440 Backbone repeater, and other frequencies and speeds.

The feeling of most of the advanced tipsy users is that the "Neighborhood Area Network", run on a tipsy PC, is almost here.

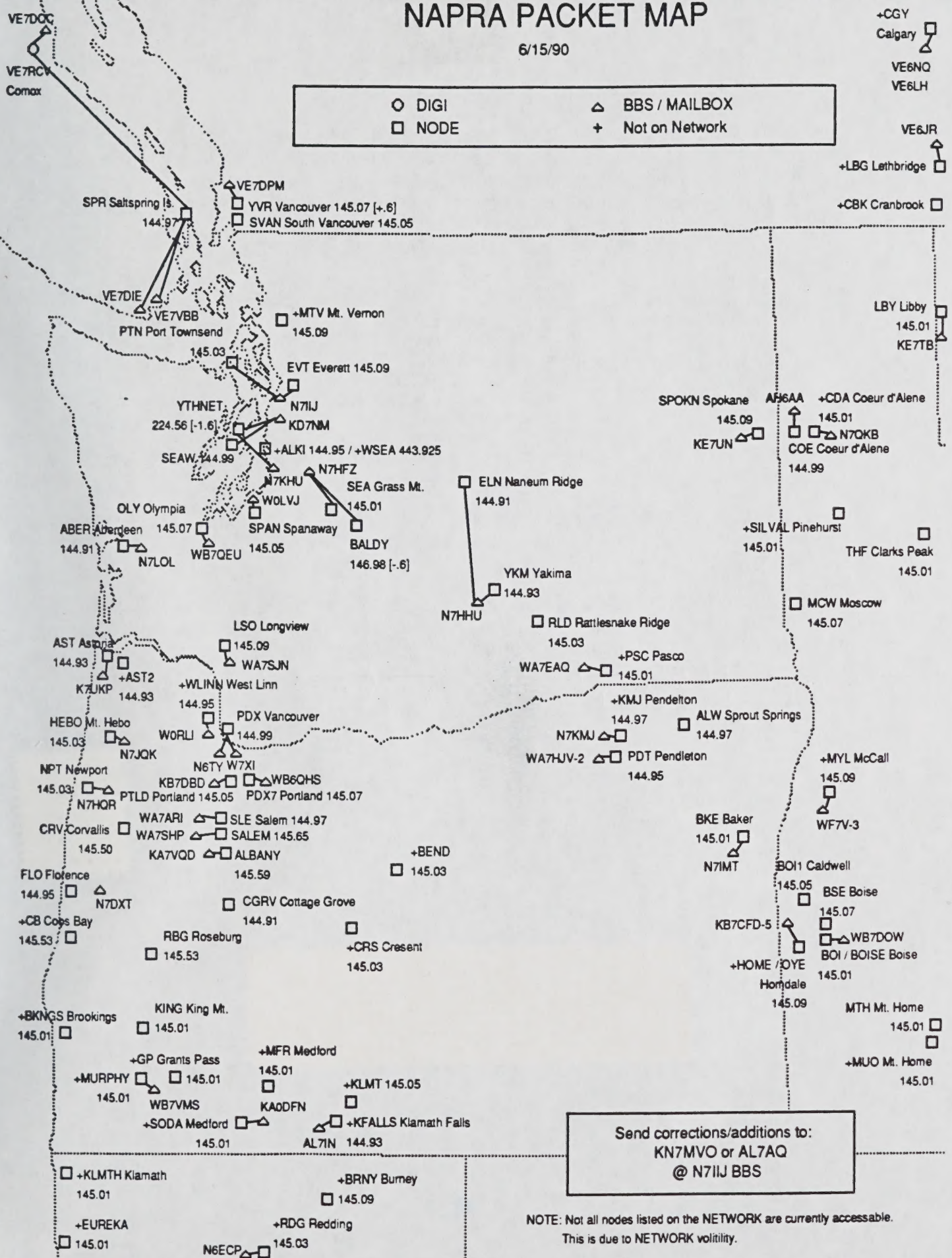
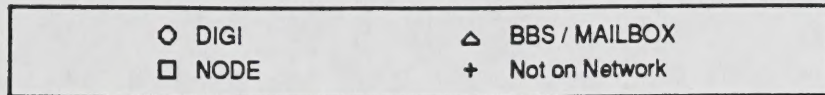
CALL	NAME	ADDRESS	CITY	ST	ZIP	HOME_PHONE	EXPI
W7KCJ	Richard Anderson	61 Saddle Drive	Port Townsend	WA	98368	206-385-2914	9001
N7AXH	Francis Anderson	2101 S. 324th Street #113	Federal Way	WA	98003	206-838-2275	9012
KA7IOQ	William Antes	1410 Sixth Ave.	Tacoma	WA	98405	206-272-4375	9012
WB7USL	Larry Babcock	14822 14th Ave. S.W.	Seattle	WA	98166	206-246-8715	9012
W1PRT	Jack Barber	4316 Chambers Lake Dr. S.E.	Lacey	WA	98503	206-438-5921	9012
N7MCH	Walter Beck	9222 NE 139th St.	Kirkland	WA	98034	206-821-5522	9002
KY7X	Don Beeson	14326 75th NE	Bothell	WA	98011	206-823-8711	9003
W7QLW	Ernest Behrle	9450 Echo Valley Rd NW	Bremerton	WA	98312		9005
NX7W	Nick Bender	514 W. Broadway	Montesano	WA	98563		9012
KB7AIL	Jeff Benedict	P.O. Box 277	Chimacum	WA	98325	206-385-5819	9001
WA7ZWD	Phil Bondurant	25960 129th Pl. S.E.	Kent	WA	98031	206-630-5284	9012
N7GWC	Gary Breivik	17341 148th Ave. SE	Yelm	WA	98597	206-894-2567	9103
N7KWJ	Virgil Carell	9101-97 Steillacoom Road S.E.	Olympia	WA	98503		9012
WB7FHC	Budd Churchward	13304 131st St. KPN	Gig Harbor	WA	98335	206-857-5271	8912
W7MZQ	Hal Cleaver	P.O. Box 602	Auburn	WA	98071	206-939-2876	9012
N7CVW	Bob Cline	14435 5th Ave. S.	Seattle	WA	98168	206-241-2107	9001
N6RY	Terry Conboy	7969 145th Ave SE	Renton	WA	98056-9207	206-228-3127	9009
KT7H	Paul 'Tad' Cook	5519 12th Ave. N.E.	Seattle	WA	98105-3505	206-527-4089	9012
N7FSP	Scott Cronk	3615 SW Andover	Seattle	WA	98126		9105
KA7EBO	Donld Crook	4103-232nd Ave. SE	Issaquah	WA	98023	206-391-0303	8908
WA7FUS	Peter Dahl	2948 217th Place SW	Brier	WA	98036	206-778-3581	9012
K7TBM	Tom Davis	15031 W. Lake Goodwin Rd.	Stanwood	WA	98292		9005
KD7NM	Robert Donnell	P.O. Box 45645	Seattle	WA	98145-0645	206-827-8005	9012
N7AZI	Murray Dow	402 Cedar Street	Vancouver	WA		206-693-4892	9003
WA1VJH	GARNET Drakiotes	13412 110TH PLACE NE	KIRKLAND	WA	98034	206-821-0684	8910
KD7ME	Phil Dunn	9104 113th St. S.W.	Tacoma	WA	98498	206-582-6337	9006
WA7IIL	Gary Eberhardt	4744 D'Milluhr Rd. NE	Olympia	WA	98506	206-459-3346	9003
KE7OM	Bill Ferguson	12406 42 Drive SE	Everett	WA	98208		8912
KE7IT	A. L. Fluesmier	1352 S. Farragut	Couville	WA	98239	206-678-3693	9005
N7BTI	John Gates	750 Northstream Lane	Edmonds	WA	98020	206-774-3777	8906
KA7CZP	Thomas Gilcrest	1411 Grant Ave. S. # G-204	Renton	WA	98055	206-226-3708	8912
K7YFJ	Robert Goodale	470 J St.	Washougal	WA	98621	206-835-3773	9003
W7AZU	Sperry Goodman	20219 106th Ave. SE	Kent	WA	98031	206-859-5114	9012
KB7DZ	Dennis Goodwin	1748 Harrison Ave. S.E. #M4	Port Orchard	WA	98366	206-871-5818	9012
KD7H	Robert Gregory	PO Box 855	Omak	WA	98841	509-826-3056	9105
W7BQG	Ellis Hamer	1402 22nd NE SP 310	Auburn	WA	98002	206-939-4895	9004
AK7S	Bob Harlen	13086 S.E. 160th Place	Renton	WA	98058	206-228-2493	9012

WA7HRA Bob Hart	P.O. Box 178	Hoodsport	WA 98548	9012
W7LBK Earl Hawley	E. 10805 27th Ave.	Spokane	WA 99206	509-927-0662 8908
WA7GBV Richard Hice	12515 35th Ave NE	Seattle	WA 98125	206-368-0684 9003
ka7wnh David Hilerbrand	3343 224th Pl. SW	Brier	WA 98036	206-774-4583 9002
WB7QEU Donald Hill	14311 Hwy 507 SE	Yelm	WA 98597	206 458-5521 9101
WB7DCH Tom Hogan	26911 S.E. 456th St.	Enumclaw	WA 98022	206-825-3019 8912
K7OOJ Lee Hopkins	General Delivery	Lyman	WA 98236	9006
KA7GKP Jim Horn	545 S.E. Bush St.	Issaquah	WA 98027	206-392-5609 8912
KA6SPY Jack Horner	470 Hillcrest Place #5	Friday Harbor	WA 98250	206-378-5377 9012
VE7FFK Fred Houghton	6706 Ross Street	Vancouver	BC V5X4B3	8912
N7LNX Steve Jackson	7705 46th SW	Seattle	WA 98136	206-935-7464 9004
N7NEI Ronald Jackson	90323 14th NW	Seattle	WA 90117	206-782-3929 9103
W7OQY Bruce Jacobson	Box 141	Manson Landing	BC V0P1K0	604-935-6501 8809
WA7TAI Gene Jacobson	7334 126th Ave. N.E.	Kirkland	WA 98033	206-822-3931 9012
WA7TIB Al Jenson	19111 1st NW	Seattle	WA 98177	206-542-6052 9005
WB7PCF Dave Kassens	P.O. Box 46578	Seattle	WA 98146-0578	9005
W7JIH Richard Kemp	1515 N. 146th St.	Seattle	WA 98133	206-363-7051 9106
W7TS Ken Kinyon	39421 260th SE	Enumclaw	WA 98022	206-825-5867 9006
W7GCI Andrew Kirkwood	6518 Ardmore Dr. SW	Tacoma	WA 98499	9008
KL7DTR Les Kometz	3018 S 14th	Tacoma	WA 98405	206-627-3895 9105
N7IPB Ken Koster	12653 NE 95th St	Kirkland	WA 98033	206-828-6467 8911
W7JWP Arnold Larson	15348 70th Ave. NE	Bothell	WA 98011	206-488-7463 9106
W7OIV Bill Lawson	2208 111th Ave. E	Puyallup	WA 98372	206-927-4009 9101
W7QGP Mary Lewis	10352 Sandpoint Way N.E.	Seattle	WA 98125	9101
KE7XT Paul Lutt	5232 120th Ave. SE	Bellevue	WA 98006	206-747-8397 8912
WB7EPL Darryl Lykkel	390 North Park Street	Lynden	WA 98264	206-354-5370 9104
w7qvb Ken Lyons	815 S 216th St Apt 441	Des Moines	WA 98198-6332	206-870-4443 9104
KB7B Andy Madsen	5012 N.E. 41st	Seattle	WA 98105	206-523-7463 9002
VE7DPM Allen Mar	7761 Curragh Ave.	Burnaby	BC V5J4W3	604-438-6783 9005
KA7TTY John McDuff	620 S.E. Bush St.	Issaquah	WA 98027	206-392-7623 9106
K7DPO Tom McKenna	12428 68th Ave. NE	Kirkland	WA 98034	206-823-5880 9105
K7RNZ Richard Miles	10794 N.W. Holly Road	Bremerton	WA 98312	206-830-9154 9009
VE7PKE Dave Miller	8827 134 AST	Surry	BC V3V5S8	604-594-2052 9005
WE7U Curt Mills	2005 216th Ave. S.E.	Issaquah	WA 98027	9105
WD8AWW David Misner	5814 Hanna Pierce Rd. W Apt. Q	Tacoma	WA 98467	8912
WA2JQW Ken Moak	3015 Oak St. SW	Tacoma	WA 98439	206-584-6494 9106
N7CAK Pat & Cal Morgan	3410 S. 356th St.	Auburn	WA 98001	206-927-2431 9012
KE7JL Bob Morrison	1803 10th W.	Kirkland	WA 98033	206-487-7000 8911
KA7ZEM Jerry Moseley	540 E Middle Point Rd.	Port Townsend	WA 98368	206-385-5064 9105

N1DMM Cliff Neuman	P.O. Box 45775	Seattle	WA 98145-0775	206-789-8788	9012
N7BCV Nick Olson	P.O. Box 31	Spanaway	WA 98387-0031		9101
N7KBT John Opalko	18028 36th Ave. W.	Lynnwood	WA 98037	206-776-8568	9105
Eugene Pedersen	3579 S Marine View Dr.	Greenbank	WA 98253	206-678-4789	9009
K7TPN Dick Phelps	612 Lawrence St.	Port Townsend	WA 98368	206-385-1415	9103
W7HTU RANDALL PHILLIPS	7627 Emerald Dr. SW	Tacoma	WA 98498		8911
KA7IFQ Wilber Powell	2603 3rd Ave N.	Lewiston	ID 83501	208-743-2716	9003
N7ICG Fleet Ratliff	6427 Tralee Ct. NW	Olympia	WA	206-866-2463	9102
N7CFB J. Reifscheinder	9101-54 Steilacomm Rd. S.E.	Olympia	WA 98503	206-491-6125	9002
W7MRT C.L. Richards	26430 S.E.	Issaquah	WA 98027		9001
WA7QFR Ren Roderick	14824 104th Ave. N.E.	Bothell	WA 98011	206-488-3171	9009
WB7WOW Bob Roesner	P.O. Box 77	Oak Harbor	WA 98277-0077	206-679-2660	8908
N7DVR Dan Rooks	P O BOX 566	Kingston	WA 98346	206-297-2533	9001
NV6Z Ron Rueter	15512 Country Club Dr. #14	Mill Creek	WA 98012	206-337-2189	9003
KC7TD Pete Saflund	25933-185th Pl SE	Kent	WA 98042	206-631-6772	9102
N7OFG Don Sandstrom	6130 East Mercer Way	Mercer Island	WA 98040	206-232-3471	9104
W7UKS Cliff Scheppler	119 143rd	Tacoma	WA 98444	206-531-5154	9012
K7QMI Tim Schneebeck	5270 University Way NE	Seattle	WA 98105	206-547-0404	9005
WN7ANK Sam Sewell III	20719 Occidental Ave. S.	Seattle	WA 98198	206-824-1301	9999
N7IPJ Michael Sinnott	P.O. Box 575	Kingston	WA 98346		9101
N7LOL Scott Sipe	7520 Blaine Rd.	Aberdeen	WA 98520	206-532-9357	9012
KA7VDY Tony Slawinski	2509 Baker Ave.	Everett	WA 98201	206-258-1720	9003
WF7A Richard Stewart	16226 36th Ave. West #209	Lynnwood	WA 98037-1419	206-742-3574	9005
N8GNJ Steven K. Stroh	14919 NE 163rd	Woodinville	WA 98072-8957	206-481-5735	9101
KB7EQI Susan Wall	13702 NE 9th Pl. #A-1 201	Bellevue	WA 98005	206-643-6239	9102
VE7AGR Al Wedmark	5681 Carson St.	Burnaby	BC V5J4W3		9005
K0CKX EUGENE Weiner	14255 121ST AVE NE	KIRKLAND	WA 98034	206-820-8393	8910
KA7TVC Clifford Wells	10601 231st St. S.W.	Edmonds	WA 98020-6153		8912
N7NKJ Don Werts	4428 S. 164th St.	Tukwila	WA 98188	206-246-1672	9012
W7MCU Leonard Westbo	10528 S.E. 323rd St.	Auburn	WA 98002	206-833-4834	9105
W7MGG Gary Whiting	3632 - 132nd St. SW	Lynnwood	WA 98037	206-745-4621	9004
K7IRO Lee Whitney	4955 Harbor Drive	Friday Harbor	WA 98250		9010
Ron Wright	E. 500 Bridger Lane	Shelton	WA 98584	206-426-7664	9003
KF7WA Gary Young	12415 226th St SE	Snohomish	WA 98290	206 486-5745	9106

NAPRA PACKET MAP

6/15/90



Send corrections/additions to:
KN7MVO or AL7AQ
@ N7IJJ BBS

NOTE: Not all nodes listed on the NETWORK are currently accessible.
This is due to NETWORK volatility.

NAPRA, the Northwest Packet Radio Association, is an organization of Amateur Radio Operators dedicated to the growth of the Amateur Packet Radio Network in the Pacific Northwest. Membership is open to all interested individuals. NAPRA's yearly dues are \$15.00 and include a subscription to NAPRA's quarterly newsletter, Zero Retries.

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